VASCULAR FLORA OF WASHITA BATTLEFIELD NATIONAL HISTORIC SITE, ROGER MILLS COUNTY, OKLAHOMA

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ABSTRACT

This article reports the results of a vascular plant inventory of the Washita Battlefield National Historic Site in western Oklahoma. Two hundred and seventy-two species of vascular plants were collected from 201 genera and 62 families. The most specious families were the Poaceae (53), Asteraceae (48), Fabaceae (22) and Euphorbiaceae (22). One hundred and seventy-five species were perennials, ninety-five annuals, and 2 biennials. Twenty-eight woody plant species were present. Twenty-one species exotic to North America were collected representing 7.7% of the flora. Five species tracked by the Oklahoma Natural Heritage Inventory were found. This study reports 205 species previously not documented in Roger Mills County.

ABSTRACT

Este artículo presenta los resultados de un inventario de flora vascular del Washita Battlefield National Historic Site en el Oeste de Oklahoma. Se colectaron doscientas setenta y dos especies de plantas vasculares pertenecientes a 201 géneros y 62 familias. Las familias con más especies fueron Poaceae (53), Asteraceae (48), Fabaceae (22) y Euphorbiaceae (22). Ciento setenta y cinco especies eran perennes, noventa y cinco anuales, y 2 bianuales. Estaban presentes veintiocho especies leñosas. Se colectaron veintiuna especies exóticas para Norte América que representan el 7.7% de la flora. Se encontraron cinco especies seguidas por el Oklahoma Natural Heritage Inventory. Este estudio cita 205 especies no documentadas previamente en el condado de Roger Mills.

INTRODUCTION

The objectives of this study were twofold; to fill a gap in floristic data for western Oklahoma and provide resource managers at the Washita Battlefield National Historic Site (WBNHS) a comprehensive species list. Prior to 2002, when collecting began for this study, 446 specific and intraspecific taxa were reported from Roger Mills County (Hoagland 2004). *Erigeron bellidiastrum* Nutt., collected by J. Engleman on 3 July 1919, was the first botanical specimen gathered in Roger Mills County. There are no subsequent collection records until 1929.

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Peak collecting years in Roger Mills County were 1939 (261 specimens), with the return of J. Engleman, and 1976 by Susan Barber and Rahmona Thompson (124 specimens) on behalf of the Robert Bebb Herbarium at the University of Oklahoma (Hoagland 2004). During the course of this research, Freeman et al. (2003) published a floristic list from the Thurman Ranch in Roger Mills County, located south of WBNHS, which documented 470 species from 85 families.

Study Area

The WBNHS was established on 12 November 1996 and encompasses 136 hectares in Roger Mills County (Fig. 1). Latitudinal extent ranges from 35.63°N to 35.62°N and longitudinal extent from 99.70°W to 99.71°W. The WBNHS is located within the subtropical humid (Cf) climate zone (Trewartha 1968). Summers are warm (mean July temperature = 27.7°C) and humid, whereas winters are relatively short and mild (mean January temperature = 1.9°C). Mean annual precipitation is 105.6 cm, with periodic severe droughts (Oklahoma Climatological Survey 2004). Physiographically, the study area is located in the Osage Plains section of the Central Lowlands province (Hunt 1974) and within the High Plains province of Oklahoma (Curtis & Ham 1979). Elevation in the study area ranges from 588 m along the Washita River to 610 m. The surface geology is primarily Permian red sandstone in the uplands to the south of the Washita River, and Quaternary silt, sand and clay adjacent to and north of the river (Branson & Johnson 1979). The primary soil association at WBFNHS is the Yahola-Port, which is composed of alluvial soils on bottomlands and terraces. The Woodward-Quinlan association occurs on uplands and is level to very steep loamy soils underlain by red sandstone (Burgess et al. 1959). The predominant potential vegetation types are mixedgrass prairie with a smaller component of bottomland forests and stabilized dunes (Duck & Fletcher 1943). Much of the Washita River bottomlands were cleared for agriculture and pasturage.

METHODS

Eight collection sites were established at WBNHS for intensive floristic sampling. Sites were selected following a review of US Geological Survey 1:24,000 topographic maps and field reconnaissance. The predominant vegetation association at these sites was classified according to Hoagland (2000). Collection effort was not limited to established sites. Collections were made on a monthly basis from March through October 2002. Vouchers for species exotic to North America were made from naturalized populations only, thus excluding cultivated and ornamental plants. Specimens were processed at the Robert Bebb Herbarium of the University of Oklahoma (OKL) following standard herbarium techniques. Manuals used for specimen identification included Correll and Johnston (1970), Gould (1975), Waterfall (1969) and Great Plains Flora Association (1986). Origin, whether native to introduced to North America, was deter-

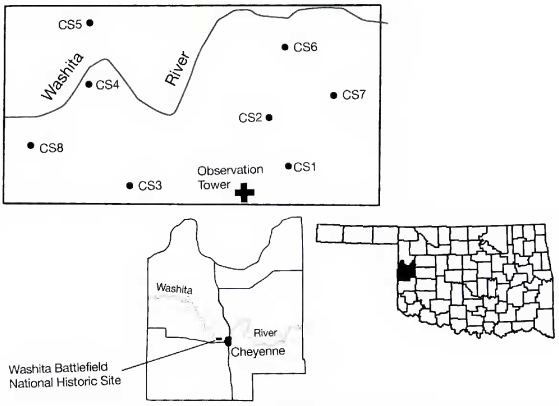

FIG. 1. Location of Washita Battlefield National Historic Site, Roger Mills County, Oklahoma.

mined using Taylor and Taylor (1991) and the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 2004). The nomenclature used is in concordance with USDA-NRCS (2004). Voucher specimens were deposited at OKL.

RESULTS AND DISCUSSION

A total of 272 vascular plants in 201 genera and 62 families were collected (Table 1). Among the angiosperms, 66 were monocots and 205 were dicots. One gymnosperm was found. The most species were collected from the families Poaceae (53), Asteraceae (48), Fabaceae (22), and Euphorbiaceae (14). The genera *Chamaesyce* (5), *Eragrostis* (4), *Dalea* (4), and *Solanum* (4) had the most species. Ninety-seven species were annual or biennials, and 178 perennial.

Twenty-one exotic species from 14 families were collected, representing 7.7% of the flora. The greatest number of exotic species were in the families Poaceae (11) and Asteraceae (4). This is higher than the 10% exotic flora reported from the Thurman Ranch (Freeman et al. 2002), but is comparable to recent floristic inventories from other areas in Oklahoma. For example, a flora of the Chickasaw National Recreation Area reported 12% exotic species (Hoagland & Johnson

TABLE 1. Summary of floristic collections at the Washita Battlefield National Historic Site, Roger Mills County, Oklahoma. Table format follows Palmer et al. (1995).

Taxonomic Group	Species	Native spp.	Introduced spp.
Equisetophyta	0	0	0
Pteridophyta	0	0	0
Coniferophyta	1	1	0
Magnoliophyta			
Magnoliopsida	205	184	21
Liliopsida	66	56	10
Total	271	240	31

2001), 9% at Oologah Wildlife Management Area (Hoagland & Wallick 2003), 15% at Keystone Wildlife Management Area, and 11% for an inventory of Tillman County (Hoagland et al., in press). However, the percentage was lower, 6.6%, at Red Slough and Grassy Slough in southeastern Oklahoma (Hoagland & Johnson, in press).

Five species tracked by the Oklahoma Natural Heritage Inventory were found: *Argythamnia humilis* (G5S2S3), *Gaura brachycarpa* (G4G5 S1S2), *Solanum triflorum* (G5S1S2), *Sporobolus giganteus* (G5S1S3), and *Zinnia grandiflora* (G5S?). Species are ranked according to level of imperilment at the state (S) and global (G) levels on a scale of 1–5, 1 representing a species that is imperiled and 5 one that is secure (Groves et al, 1995).

As a result of this study, 651 species are now known to occur in Roger Mills County. Of the 361 species reported in this study, 156 had been previously collected in the county (Hoagland 2004). This study documented 205 species not previously reported from Roger Mills County. When compared with the Dempsey Divide site (Freeman et al. 2002), there were 219 species found at both sites. However, 53 species were documented at WBNHS that were not reported at Dempsey Divide. Two hundred and fifty-one additional species were found on the Dempsey Divide that were not found at the WBNHS. The difference in total area of the two sites may account for this discrepancy; the Thurman Ranch is 3,755 hecatres in area and contains 19 vegetation types whereas WABA is only 136 hectares with four vegetation types. (Freeman et al. 2002).

The 8 collection sites occurred within four vegetation associations. A brief description of each follows:

***Sapindus saponaria* woodland association**

This association was limited to large sand dunes located on the northside of the Washita River. Although *S. saponaria* was abundant, dominance was locally variable. *Celtis laevigata* var. *reticulata* was a common woody species in this vegetation association, as was *Ulmus pumila*, a species introduced to western Oklahoma for shelterbelt plantings. Other common woody species included *Forestiera*

pubescens, Gymnocladus dioicus, Prunus angustifolia, Ribes aureum, and *Sideroxylon lanuginosum.* Associated herbaceous species included *Andropogon hallii, Argemone polyanthemos, Asclepias arenaria, Cyclanthera dissecta, Dimorphocarpa candicans, Froelichia gracilis,* and *Funastrum cynanchoides.*

***Schizachyrium scoparium—Bouteloua hirsuta* herbaceous association**

Occurred on Permian red sandstone in the uplands overlain by the Woodward-Quinlan soil association. Associated species included *Aristida oligantha, Ambrosia psiolstachya, Bouteloua curtipendula, Eriogonum annuum, Penstemon albidus, Sphaeralcea coccinea, Thelesperma megapotamicum,* and *Yucca glauca.*

Disturbed areas and old-field vegetation

This includes much of the Washita River floodplain, which had been under cultivation for many years. It also includes roadsides and areas visited by WBNHS visitors and other areas exhibiting signs of physical disruption. Common plants in disturbed areas and old fields included *Ambrosia trifida, Bothriochloa ischaemum, Chenopodium simplex, Cynodon dactylon, Digitaria ciliaris, Melilotus officinalis,* and *Sorghum halepense.*

APPENDIX 1

Annotated species list for the Washita Battlefield National Historic Site. The first entry indicates life history (**A**=annual, **P**=perennial), species not native to North America (designated with an asterisk), habitat (**DAOF**=disturbed area/old-field; **MGP**=mixed grass prairie; **RA**=riparian area; **SW**=sandy woodland), and collection number. Voucher specimens were deposited at the Robert Bebb Herbarium at the University of Oklahoma (OKL).

PINOPHYTA

Cupressaceae

Juniperus virginiana L.–P; SW; WAS193

MAGNOLIOPHYTA
MAGNOLIOPSIDA

Amaranthaceae

Amaranthus albus L.–A; MGP; WAS322
Amaranthus palmeri S. Wats.–A; DAOF; WAS093
Froelichia gracilis (Hook.) Moq.–A; SW; WAS103

Anacardiaceae

Rhus aromatica L.–P; MGP; WAS230
Rhus glabra L.–P; MGP; WAS044
Toxicodendron radicans (L.) Kuntze–P; RA; WAS183

Apiaceae

Chaerophyllum tainturieri Hook.–A; MGP; WAS222
Cymopterus macrorhizus Buckl.–P; MGP; WAS171

Apocynaceae

Apocynum cannabinum L.–P; SW; WAS192

Asclepiadaceae

Asclepias arenaria Torr.–P; MGP, SW; WAS071
Asclepias asperula (Dcne.) Schlechter–P; MGP; WAS195
Asclepias stenophylla A. Gray–P; MGP; WAS050
Asclepias syriaca L.–P; MGP; WAS280
Funastrum cynanchoides (Dcne.) Schlechter–P; SW; WAS100

Asteraceae

Ambrosia psilostachya DC.–P; MGP; WAS148
Ambrosia trifida L.–A; MGP; WAS295
Amphiachyris dracunculoides (DC.) Nutt.–A; MGP; WAS283
Aphanostephus skirrhobasis (DC.) Trel.–A; MGP; WAS323
Artemisia dracunculus L.–P; MGP; WAS293
Artemisia filifolia Torr.–P; MGP; WAS116

Artemisia ludoviciana Nutt.–P; MGP; WAS289
Baccharis salicina Torr. & A. Gray–P; RA; WAS118
Brickellia eupatorioides (L.) Shinners–P; MGP; WAS294
Chaetopappa ericoides (Torr.) Nesom–P; MGP; WAS015
Cirsium undulatum (Nutt.) Spreng.–P; MGP; WAS248
Cirsium vulgare (Savi) Ten.–B; MGP; WAS247
Conyza canadensis (L.) Cronq.–A; DAOF; WAS141
Eclipta prostrata (L.) L.–A; RA; WAS133
Engelmannia peristenia (Raf.) Goodman & Lawson–P; MGP; WAS034
Erigeron bellidiastrum Nutt.–A; MGP, SW; WAS188
Eupatorium serotinum Michx.–P; RA; WAS129
Euthamia gymnospermoides Greene–P; DAOF; WAS314
Gaillardia pulchella Foug.–A; MGP; WAS228
Gaillardia suavis (A. Gray & Engelm.) Britt. & Rusby–P; MGP; WAS229
Grindelia papposa Nesom & Suh–A; MGP; WAS153
Helianthus annuus L.–A; DAOF; WAS080
Helianthus maximiliani Schrad.–P; DAOF; WAS309
Helianthus petiolaris Nutt.–A; DAOF; WAS084
Heterotheca subaxillaris (Lam.) Britt. & Rusby–A; MGP; WAS144
Heterotheca villosa (Pursh) Shinners–P; MGP; WAS028
Hymenopappus flavescens A. Gray–B; MGP; WAS258
Iva annua L.–P; DAOF, RA; WAS317
Lactuca serriola L.*–A; MGP; WAS022
Liatris pycnostachya Michx.–P; MGP; WAS282
Lygodesmia juncea (Pursh) D. Don ex Hook.–P; MGP; WAS285
Machaeranthera pinnatifida (Hook.) Shinners–P; MGP; WAS277
Pluchea odorata (L.) Cass. var. *odorata*–A, RA; WAS108
Ratibida columnifera (Nutt.) Woot. & Standl.–P; MGP; WAS276
Solidago canadensis L.–P; DAOF; WAS113
Solidago gigantea Ait.–P; DAOF; WAS139
Solidago petiolaris Ait.–P; MGP; WAS306
Symphyotrichum ericoides (L.) Nesom–P; DAOF; WAS311
Symphyotrichum oblongifolium (Nutt.) Nesom–P; MGP; WAS303
Symphyotrichum subulatum (Michx.) Nesom–A; RA; WAS132
Taraxacum officinale G.H. Weber ex Wiggers*–P; DAOF; WAS302
Tetraneuris scaposa (DC.) Greene–P; MGP; WAS226
Thelesperma megapotamicum (Spreng.) Kuntze–P; MGP; WAS051
Tragopogon dubius Scop.*–A; DAOF; WAS182
Verbesina encelioides (Cav.) Benth. & Hook.f. ex A. Gray–A; DAOF; WAS087
Vernonia baldwinii Torr.–P; DAOF; WAS105
Xanthium strumarium L.–A; RA; WAS135
Zinnia grandiflora Nutt.–P; MGP; WAS271

Boraginaceae

Heliotropium convolvulaceum (Nutt.) A. Gray–A; SW; WAS095
Lithospermum incisum Lehm.–P; MGP; WAS172

Brassicaceae

Camelina rumelica Velen.–A; MGP; WAS231
Capsella bursa pastoris (L.) Medik.*–A; DAOF; WAS176
Descurainia pinnata (Walt.) Britt.–A; MGP; WAS177
Dimorphocarpa candicans (Raf.) Rollins–A; SW; WAS120
Draba reptans (Lam.) Fern.–A; MGP; WAS161
Lepidium oblongum Small–A; MGP; WAS175
Lesquerella gordonii (A. Gray) S. Wats.–A; MGP; WAS179

Cactaceae

Escobaria vivipara (Nutt.) Buxbaum–P; MGP; WAS315
Opuntia macrorhiza Engelm.–P; MGP; WAS159

Campanulaceae

Triodanis holzingeri McVaugh–A; MGP; WAS266

Caryophyllaceae

Arenaria serpyllifolia L.*–A; DAOF; WAS163
Paronychia jamesii Torr. & A. Gray–P; MGP; WAS055
Stellaria media (L.) Vill.*–A; DAOF; WAS174

Chenopodiaceae

Chenopodium album L.*–A; MGP; WAS287
Chenopodium simplex (Torr.) Raf.–A; MGP; WAS150
Cycloloma atriplicifolium (Spreng.) Coult.–A; MGP; WAS264
Kochia scoparia (L.) Schrad.*–A; MGP; WAS009

Convolvulaceae

Convolvulus arvensis L.*–P; MGP; WAS196
Evolvulus nuttallianus J. A. Schultes–P; MGP; WAS215
Ipomoea leptophylla Torr.–P; MGP; WAS260

Cucurbitaceae

Cucurbita foetidissima Kunth–P; MGP; WAS018
Cyclanthera dissecta (Torr. & A. Gray) Arn.–A; SW; WAS140

Euphorbiaceae

Acalypha ostryifolia Riddell–A; MGP; WAS031
Argythamnia humilis (Engelm. & A. Gray) Muell.-Arg.–P; MGP; WAS068
Chamaesyce fendleri (Torr. & A. Gray) Small–P; MGP; WAS060
Chamaesyce glyptosperma (Engelm.) Small–A; MGP, SW; WAS090
Chamaesyce maculata (L.) Small–A; DAOF; WAS122
Chamaesyce missurica (Raf.) Shinners–A; MGP, DAOF; WAS304
Chamaesyce stictospora (Engelm.) Small–A; DAOF; WAS069
Croton glandulosus L.–A; MGP; WAS037
Croton texensis (Klotzsch) Muell.-Arg.–A; MGP; WAS011
Euphorbia dentata Michx.–A; MGP; WAS012
Euphorbia hexagona Nutt. ex Spreng.–A; MGP; WAS112
Euphorbia longicruris Scheele–A; MGP; WAS160
Euphorbia marginata Pursh–A; DAOF; WAS142
Tragia ramosa Torr.–P; MGP; WAS058

Fabaceae

Amorpha fruticosa L.–P; RA; WAS086
Astragalus lotiflorus Hook.–P; MGP; WAS180
Astragalus plattensis Nutt.–P; MGP; WAS181
Baptisia australis (L.) R. Br. ex Ait. f.–P; MGP; WAS191
Caesalpinia jamesii (Torr. & A. Gray) Fisher–P; SW; WAS102
Cercis canadensis L.–P; DAOF; WAS065
Chamaecrista fasciculata (Michx.) Greene–A; MGP; WAS047
Dalea aurea Nutt. ex Pursh–P; MGP; WAS274
Dalea candida Michx. ex Willd.–P; MGP; WAS267
Dalea enneandra Nutt.–P; MGP; WAS057
Dalea purpurea Vent.–P; MGP; WAS250
Desmodium illinoense A. Gray–P; MGP; WAS032
Gleditsia triacanthos L.–P; SW; WAS300
Gymnocladus dioicus (L.) K. Koch–P; SW; WAS016
Indigofera miniata Ortega–P; SW; WAS091
Medicago minima (L.) L.*–A; DAOF; WAS224
Melilotus officinalis (L.) Lam.*–A; DAOF; WAS246
Mimosa borealis A. Gray–P; MGP; WAS199
Mimosa nuttallii (DC.) B.L. Turner–P; MGP; WAS201
Pediomelum linearifolium (Torr. & A. Gray) J. Grimes–P; MGP; WAS048
Sophora nuttalliana B.L. Turner–P; MGP; WAS243
Strophostyles leiosperma (Torr. & A. Gray) Piper–A; MGP; WAS042

Fumariaceae

Corydalis micrantha (Engelm. ex A. Gray) A. Gray–A; MGP; WAS178

Geraniaceae

Erodium cicutarium (L.) L'Her. ex Ait.*–A; DAOF; WAS169
Geranium pusillum L.*–A; MGP; WAS218

Grossulariaceae

Ribes aureum Pursh–P; SW; WAS167

Juglandaceae

Juglans microcarpa Berl.–P; SW; WAS101

Krameriaceae

Krameria lanceolata Torr.–P; MGP; WAS039

Lamiaceae

Lamium amplexicaule L.*–A; DAOF; WAS168
Lycopus americanus Muhl. ex W. Bart.–P; RA; WAS128
Monarda clinopodioides A. Gray–A; MGP; WAS251
Monarda punctata L.–A; MGP; WAS254
Salvia azurea Michx. ex Lam.–P; MGP; WAS301
Scutellaria resinosa Torr.–P; MGP; WAS040
Scutellaria wrightii A. Gray–P; MGP; WAS214
Teucrium canadense L.–P; RA; WAS075
Teucrium laciniatum Torr.–P; MGP; WAS221

Linaceae

Linum pratense (J.B.S. Norton) Small–A; MGP; WAS212
Linum rigidum Pursh–A; MGP; WAS204

Loasaceae

Mentzelia nuda (Pursh) Torr. & A. Gray–P; MGP; WAS155

Lythraceae

Ammania coccinea Rottb.–A; RA; WAS143

Malvaceae
Callirhoe involucrata (Torr. & A. Gray) A. Gray–P; MGP; WAS279
Hibiscus trionum L.*–P; MGP; WAS269
Sphaeralcea coccinea (Nutt.) Rydb.–P; MGP; WAS219

Menispermaceae
Cocculus carolinus (L.) DC.–P; SW; WAS078

Molluginaceae
Mollugo verticillata L.–A; DAOF, SW; WAS024

Moraceae
Morus alba L.*–P; DAOF; WAS061

Nyctaginaceae
Mirabilis albida (Walt.) Heimerl–P; MGP; WAS298
Mirabilis linearis (Pursh) Heimerl–P; MGP; WAS030
Mirabilis nyctaginea (Michx.) MacM.–P; MGP, SW; WAS189

Oleaceae
Forestiera pubescens Nutt.–P; SW; WAS036

Onagraceae
Calylophus berlandieri Spach–P; MGP; WAS207
Calylophus hartwegii (Benth.) Raven–P; MGP; WAS237
Calylophus serrulatus (Nutt.) Raven–P; MGP; WAS049
Gaura brachycarpa Small–A; MGP; WAS202
Gaura parviflora Dougl. ex Lehm.–A; MGP; WAS010
Oenothera jamesii Torr. & A. Gray–P; RA; WAS125
Oenothera laciniata Hill–P; MGP; WAS206
Oenothera rhombipetala Nutt. ex Torr. & A. Gray–P; MGP; WAS265

Oxalidaceae
Oxalis stricta L.–P; SW; WAS110

Papaveraceae
Argemone polyanthemos (Fedde) G.B. Ownbey–A; SW; WAS098

Pedaliaceae
Proboscidea louisianica (P. Mill.) Thellung–A; MGP; WAS041

Plantaginaceae
Plantago patagonica Jacq.–A; MGP; WAS197
P. rhodosperma Dcne.–A; MGP; WAS225

Polygonaceae
Eriogonum annuum Nutt.–A; DAOF, MGP; WAS088
Eriogonum longifolium Nutt.–P; MGP; WAS054
Polygonum aviculare L.*–A; MGP; WAS014
Polygonum lapathifolium L.–A; RA; WAS136
Rumex crispus L.*–P; MGP; WAS185

Portulacaceae
Portulaca oleracea L.–A; OF; WAS066

Primulaceae
Androsace occidentalis Pursh–A; MGP; WAS162

Ranunculaceae
Delphinium carolinianum Walt. ssp. *virescens* (Nutt.) Brooks–P; MGP; WAS240

Rosaceae
Prunus angustifolia Mars.–P; SW; WAS291

Rubiaceae
Cephalanthus occidentalis L.–P; RA; WAS106
Galium pilosum Ait.–P; DAOF; WAS089
Hedyotis nigricans (Lam.) Fosberg–P; MGP; WAS273

Salicaceae
Populus deltoides Bartr. ex Marsh.–P; RA; WAS117
Salix exigua Nutt.–P; RA; WAS111
Salix nigra Marsh.–P; RA; WAS085

Sapindaceae
Sapindus saponaria L.–P; SW; WAS070

Sapotaceae
Sideroxylon lanuginosum Michx.–P; SW; WAS046

Scrophulariaceae
Castilleja purpurea (Nutt.) G. Don var. *citrina* (Pennell) Shinners–P; MGP; WAS232
Penstemon albidus Nutt.–P; MGP; WAS213
Veronica arvensis L.*–A; DAOF; WAS165

Solanaceae
Chamaesaracha conioides (Moric. ex Dunal) Britt.–P; MGP; WAS238
Physalis cinerascens (Dunal) A.S. Hitchc.–P; MGP; WAS205
Physalis longifolia Nutt.–P; MGP; WAS019
Quincula lobata (Torr.) Raf.–P; DAOF; WAS203
Solanum dimidiatum Raf.–P; DAOF; WAS194
Solanum elaeagnifolium Cav.–P; DAOF, MGP; WAS234
Solanum rostratum Dunal–A, DAOF, MGP; WAS025
Solanum triflorum Nutt.–A; MGP; WAS029

Tamaricaceae
Tamarix ramosissima Ledeb.*–P; RA; WAS115

Ulmaceae
Celtis laevigata Willd. var. *reticulata* (Torr.) L. Benson–P; SW; WAS045
Ulmus pumila L.*–P; SW; WAS268
Ulmus rubra Muhl.–P; SW; WAS154

Urticaceae
Parietaria pensylvanica Muhl. ex Willd.–A; DAOF, SW; WAS190

Verbenaceae
Glandularia pumila (Rydb.) Umber–A; DAOF, MGP; WAS198
Phyla lanceolata (Michx.) Greene–P; RA; WAS096

Violaceae
Hybanthus verticillatus (Ortega) Baill.–P; MGP; WAS242

Vitaceae
Ampelopsis cordata Michx.–P; RA; WAS121
Cissus incisa auct. non Des Moulins–P; SW; WAS072
Vitis acerifolia Raf.–P; RA; WAS109

Zygophyllaceae
Kallstroemia parviflora J.B.S. Norton–A; DAOF; WAS004
Tribulus terrestris L.*–A; DAOF; WAS308

LILIOPSIDA

Agavaceae
Yucca glauca Nutt.–P; MGP; WAS200

Commelinaceae
Commelina erecta L.–P; MGP; WAS052
Tradescantia occidentalis (Britt.) Symth–P; MGP; WAS217

Cyperaceae
Carex gravida Bailey–P; MGP; WAS241
Cyperus odoratus L.–A; MGP; WAS145
Cyperus schweinitzii Torr.–P; MGP; WAS023
Cyperus setigerus Torr. & Hook.–P; RA; WAS126
Fimbristylis vahlii (Lam.) Link–A; RA; WAS137
Schoenoplectus pungens (Vahl) Pall–P; RA; WAS077

Iridaceae
Sisyrinchium angustifolium P. Mill.–P; MGP; WAS236

Juncaceae
Juncus torreyi Coville–P; RA; WAS083

Liliaceae
Allium canadense L.–P; MGP; WAS227
Allium drummondii Regel–P; MGP; WAS173

Poaceae
Andropogon hallii Hack.–P; MGP, SW; WAS073
Aristida oligantha Michx.–A; MGP; WAS325
Aristida purpurea Nutt.–P; MGP; WAS053
Bothriochloa ischaemum (L.) Keng*–P; MGP; WAS299
Bothriochloa laguroides (DC.) Herter–P; MGP; WAS257
Bouteloua curtipendula (Michx.) Torr.–P; MGP; WAS020
Bouteloua gracilis (Willd. ex Kunth) Lag. ex Griffiths–P; DAOF, MGP; WAS272
Bouteloua hirsuta Lag.–P; MGP; WAS005
Bromus japonicus Thunb. ex Murr.*–A; DAOF, SW; WAS239
Buchloe dactyloides (Nutt.) Engelm.–P; DAOF, MGP; WAS223
Cenchrus spinifex Cav.–P; SW; WAS097
Chloris verticillata Nutt.–P; DAOF, MGP; WAS263
Cynodon dactylon (L.) Pers.*–P; DAOF; WAS255
Dichanthelium malacophyllum (Nash) Gould–P; MGP; WAS261
Dichanthelium oligosanthes (J.A. Schultes) Gould–P; MGP; WAS253
Digitaria ciliaris (Retz.) Koel.–P; DAOF; WAS001
Digitaria cognata (J.A. Schultes) Pilger–P; MGP; WAS256
Distichlis spicata (L.) Greene–P; DAOF; WAS062
Echinochloa crus-galli (L.) Beauv.*–A; RA; WAS127
Elymus canadensis L.–P; MGP; WAS297
Elymus virginicus L.–P; RA; WAS076
Eragrostis barrelieri Daveau*–A; DAOF; WAS307
Eragrostis cilianensis (All.) Vign. ex Janchen*–A; DAOF; WAS007
Eragrostis curvula (Schrad.) Nees*–P; MGP; WAS281
Eragrostis spectabilis (Pursh) Steud.–P; SW; WAS099
Erioneuron pilosum (Buckl.) Nash–P; MGP; WAS318
Hordeum pusillum Nutt.–A; DAOF; WAS208
Leptochloa fusca (L.) Kunth ssp. *fascicularis* (Lam.) N. Snow–A; RA; WAS134
Lolium perenne L.*–P; MGP; WAS252

Muhlenbergia asperifolia (Nees & Meyen ex Trin.) Parodi–P; SW; WAS158
Muhlenbergia racemosa (Michx.) B.S.P.–P; MGP; WAS152
Muhlenbergia sobolifera (Muhl. ex Willd.) Trin.–P; MGP; WAS151
Panicum capillare L.–A; MGP; WAS026
Panicum obtusum Kunth–P; MGP, RA; WAS124
Panicum virgatum L.–P; MGP; WAS319
Pascopyrum smithii (Rydb.) A. Love–P; MGP; WAS064
Paspalum setaceum Michx.–P; DAOF; WAS081
Poa arachnifera Torr.–P; RA; WAS244
Saccharum giganteum (Walt.) Pers.–P; RA; WAS147
Schedonnardus paniculatus (Nutt.) Trel.–P; DAOF; WAS063
Schizachyrium scoparium (Michx.) Nash–P, MGP; WAS156
Setaria parviflora (Poir.) Kerguelen–P; DAOF; WAS114
Setaria viridis (L.) Beauv.* –A; MGP; WAS021
Sorghastrum nutans (L.) Nash–P; MGP; WAS130
Sorghum halepense (L.) Pers.*–P; DAOF; WAS270
Spartina pectinata Bosc ex Link–P; RA; WAS074
Sporobolus cryptandrus (Torr.) A.Gray–P; MGP, SW; WAS079
Sporobolus giganteus Nash–P; MGP; WAS321
Sporobolus vaginiflorus (Torr. ex A. Gray) Wood–A; SW; WAS138
Tridens flavus (L.) A.S. Hitchc.–P; DAOF; WAS119
Triplasis purpurea (Walt.) Chapman–A; MGP; WAS288
Triticum aestivum L.*–A; DAOF; WAS187
Vulpia octoflora (Walt.) Rydb.–A; MGP; WAS211

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